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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Ronald N. Miles

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EXAMINER

LE, HUYEN D

ART UNIT

PAPER NUMBER

2614

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DELIVERY MODE

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/689,189	Applicant(s) MILES ET AL.	
	Examiner HUYEN D. LE	Art Unit 2614	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 20 October 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>10/20/03 and 09/07/04</u> . | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Claim Objections

1. Claims 1, 4-7, 11-15, 19, 22-25 are objected to because of the following: In claims 1, 4-7, 11-15, 19 and 22-25, "plate-like" and "box-like" do not have a positive limitation, "-like" should be changed to --shaped-- or delete. Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. Claims 4 and 22 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

In claims 4 and 22, it does not clear what the "similar material" is referred to.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

- (a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.
- (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
- (c) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1-2, 4-6 and 11-14 are rejected under 35 U.S.C. 102(a) as being anticipated by Loeppert et al. (US 6,535,460).

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Regarding claim 1, as broadly claimed, Loeppert'460 teaches an acoustic diaphragm (12) that comprises a rigid plate-shaped member (40, 41, 42, 43) supported upon and is pivotal about a side thereof (figures 5, 6), wherein the rigid plate-shaped member (40, 41, 42, 43) has torsional and translational stiffeners as claimed (also see col. 5, lines 20-23 and col. 6, lines 3-10).

Regarding claim 2, as broadly claimed, Loeppert'460 teaches the stiffeners (40, 41) comprising cross members (bumps 41 and 43, figures 1, 3) on or over the diaphragm (12).

Regarding claims 4 and 12, Loeppert'460 et al. teaches the rigid member (40) that is fabricated of polycrystalline silicon as claimed (col. 3, lines 53-62).

Regarding claims 5, 6 and 13-14, Loeppert'460 et al. shows the rigid member (40) that comprises a substantially flat shape or a box shape as claimed.

Regarding claim 11, as broadly claimed, Loeppert'460 et al. teaches an acoustic diaphragm (12) that comprises a rigid plate-shaped member (40, 41, 42, 43) supported upon and is pivotal about a "T" section disposed a side thereof (figures 5, 6), wherein the rigid plate-shaped member (40, 41, 42, 43) has torsional and translational crossbar stiffeners (bumps 41 and 43) as claimed (also see col. 5, lines 20-23 and col. 6, lines 3-10).

5. Claims 19-20 and 22-24 are rejected under 35 U.S.C. 102(b) as being anticipated by Loeppert et al. (US 5,870,482).

Regarding claim 19, Loeppert'482 teaches an acoustic diaphragm (12) having a dynamic response extending through the audible range, and the acoustic diaphragm (12) comprising a rigid plate-shaped member cantilevered about one side thereof (figures 1, 1a). The rigid plate-

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shaped member has torsional and translational stiffeners (figure 1a, 6a, 6b, 7a, col. 4, 49-63 and col. 5, lines 1-31) as claimed

Regarding claim 20, as broadly claimed, Loeppert'482 shows the stiffeners comprising cross members (32, figures 1a, 6a, 6b, 7a) as claimed.

Regarding claim 22, as broadly claimed, Loeppert'482 teaches the rigid member of the diaphragm that is fabricated of silicon material as claimed (col. 4, lines 7-30 and col. 5, lines 32-35).

Regarding claims 23-24, Loeppert'482 shows the rigid member of the diaphragm that comprises a substantially flat shape or a box shape (figures 1, 1a, 10) as claimed.

Claim Rejections - 35 USC § 103

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

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7. Claims 3, 7-10 and 15-18 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loeppert et al. (US 6,535,460).

Regarding claim 3, Loeppert'460 shows the side that supports the diaphragm comprising a "T" section (figure 6). Loeppert'460 does not specifically teach that the length and cross-section of this section can be varied as claimed. However, Loeppert'460 does teach that the dimensions of the diaphragm and the rigid plate-shaped member or the support structure (40, 41, 42, 43) can be chosen such that the resonance frequency is larger than the maximum acoustic operating frequency (col. 3, lines 18-34).

Therefore, it would have been obvious to one skilled in the art to provide the length and the cross section of the section (40, 41, 43) supporting the diaphragm can be varied to tune the acoustic diaphragm (12) for a desired resonant frequency.

Regarding claims 7-8, 15 and 16, Loeppert'460 does not specifically disclose the thickness of the rigid member and the dimensions of the torsional and translational stiffeners as claimed. However, Loeppert'460 does teach that the rigid plate-shaped member or the support structure (40, 41, 42, 43) can be chosen such that the resonance frequency is larger than the maximum acoustic operating frequency (col. 3, lines 18-34).

Therefore, it would have been obvious to one skilled in the art to provide any thickness and dimensions for the rigid plate-shaped member and the stiffeners such as providing the rigid plate-shaped member having approximately 2 microns thick and providing the stiffeners having approximately 4 microns thick and 40 microns tall depending on the desired resonant frequencies.

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Regarding claims 9-10, 17 and 18, Loeppert'460 does not specifically disclose the first and second resonance frequencies as claimed. However, Loeppert'460 does not restrict to the applications for the acoustic transducer (col. 1, lines 26-32).

Therefore, it would have been obvious to one skilled in the art to provide the acoustic transducer of Loeppert to be used in any applications such as transducers or sensors having the resonance frequencies of approximately 24 kHz or 84 kHz for greater applications.

8. Claims 21 and 25-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Loeppert et al. (US 5,870,482).

Regarding claim 21, Loeppert'482 shows the side that is cantilevered comprising a "T" section as claimed (figures 1, 1a). Loeppert'482 does not specifically teach that the length and cross-section of this section can be varied as claimed. However, Loeppert does not restrict to any size, length or cross section of the microphone.

Therefore, it would have been obvious to one skilled in the art to provide any size or the length for the microphone such as providing the length and cross section the microphone and the diaphragm of Loeppert'482 to be varied for the improved or desired resonant frequencies.

Regarding claims 25-26, Loeppert'482 does not specifically disclose the thickness of the rigid member and the dimensions of the torsional and translational stiffeners as claimed. However, Loeppert'482 does not restrict to the size of the microphone; it therefore would have been obvious to one skilled in the art to provide any thickness and dimensions for the rigid plate-shaped member and the stiffeners of the diaphragm such as providing the rigid plate-shaped member having approximately 2 microns thick and providing the stiffeners having

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approximately 4 microns thick and 40 microns tall depending on the desired resonant frequencies.

Regarding claims 27-28, Loeppert'482 does not specifically disclose the first and second resonance frequencies as claimed. However, Loeppert'482 does not restrict to the applications for the microphone (col. 2, lines 30-36).

Therefore, it would have been obvious to one skilled in the art to provide the microphone of Loeppert'482 to be used in any applications such as transducers or sensors having the resonance frequencies of approximately 24 kHz or 84 kHz for greater applications.

Conclusion

9. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Pedersen (US 7,146,016) teaches a construction of a miniature condenser microphone.

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to HUYEN D. LE whose telephone number is (571) 272-7502. The examiner can normally be reached on 9:30AM-6:00PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, CURTIS KUNTZ can be reached on (571) 272-7499. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/HUYEN D. LE/
Primary Examiner, Art Unit 2614

HL
April 25, 2009